

11. (Amended) A process for production of a sintered oxide ceramic of composition  $Ce_xM_yD_zO_{2-a}$  with dense structure without open porosity or with a predetermined porosity comprising the steps of:

using a first doping element M selected from the group

consisting of rear earths, but wherein  $M \neq Ce$ ,

alkali metals, earth alkali metals, and Ga;

using an educt with a second doping element D of at

least one metal, but wherein  $D \neq M$ , selected from

the group consisting of Cu, Co, Fe, Ni, and Mn

wherein second doping element D is of submicron

particle size or is a salt solution; and

sintering the educts at a temperature between 750-

1200°C until a density of at least around 98% of

the theoretically possible density is reached to

form said oxide ceramic having a grain size no

greater than  $0.5 \mu m$  and wherein the mol fractions

used range from  $0.5 \leq x \leq 1$  for Ce,  $0 \leq y \leq 0.5$

for first doping element M, and  $0.0001 \leq z \leq 0.05$

for second doping element D.

18. (Amended) The process according to claim 11 comprising the additional steps of:

monitoring a temperature rise of said composition;